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The assessment of schizotypy by the O-LIFE (Oxford-Liverpool Inventory for Feelings and Experiences) in patients with schizophrenia and affective disorders

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Summary

Aim. The aim of the study was to assess schizotypy by using the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE), in the groups of patients with schizophrenia, bipolar disorder (BD) and unipolar (recurrent) depression (UD). An important element of the study was to compare – in terms of similarity – the results obtained in schizophrenia and BD, and – in terms of differences – the results obtained in BD and UD.

Methods. The study involved 58 patients with schizophrenia (35 men, 23 women, mean age = 34.0, SD = 9.8), 52 patients with BD (22 men, 30 women, mean age = 40.3, SD = 13.6) and 57 UD patients (24 men, 33 women, mean age = 50.2, SD = 11.9), treated in the Department of Adult Psychiatry, Poznan University of Medical Sciences. For the assessment of schizotypy, the full version of the O-LIFE questionnaire (104 questions) was used, including such dimensions as: *unusual experiences, cognitive disorganization, introvertive anhedonia* and *impulsive nonconformity*.

Results. The biggest differences between diagnostic groups were found in the dimensions of *unusual experiences* and *impulsive nonconformity*. Similarities between schizophrenia and BD were found for *unusual experiences, cognitive disorganization* and *introvertive anhedonia*. Differences between BD and UD were obtained for *unusual experiences* and *impulsive nonconformity*.

Conclusions. The assessment of schizotypy in three diagnostic groups (it was the first study in patients with UD), allowed to address contemporary pathogenic and clinical concepts pertaining to similarities between schizophrenia and BD as well as to differences between two types of affective disorders.

Key words: schizophrenia, affective disorders, schizotypy

The study was not sponsored.

Introduction

The topic of research in this paper is schizotypy, assessed by the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE) in patients with schizophrenia and affective disorders – bipolar disorder and unipolar depression. Gordon Claridge – the author of the O-LIFE scale – perceives schizotypy as a psychotic part of personality, being present in each individual [1, 2]. In the model, created by him, schizotypy is a common element of individual variation, but also describes a predisposition, which – under the influence of environmental or internal factors – may lead to a development of pathological symptoms. The O-LIFE scale includes 4 areas: a tendency to feel unusual perceptual and cognitive sensations, cognitive disorganization – similar to formal thought disorders, tendency to anhedonia and introversion, as well as impulsivity and ignoring general social rules [2]. The detailed description of the O-LIFE scale and the research conducted with its use was published in the previous paper [3].

The study of schizotypy performed in this paper includes three diagnostic categories, and gives an opportunity to address two pathogenic and clinical issues of contemporary psychiatry, such as similarities between schizophrenia and bipolar disorder (BD) and the differences between two types of affective disorders: BD and unipolar depression (UD).

A suggestion as to similarity between schizophrenia and BD is an aftermath of the continuum of psychosis concept, the biggest proponent of which in recent years was the British psychiatrist, Timothy Crow. The author indicates that clinical observations do not support to maintain Kraepelin's binary concept, which clearly separates affective disorders from schizophrenia. Thus, he advocates using an alternative to Kraepelinian concept, perceiving psychosis as a continuum, extending from unipolar through bipolar and schizoaffective disorder to schizophrenia [4]. A Swedish study, including 2 million families, demonstrated that, first-degree relatives of schizophrenia patients have a higher risk of developing bipolar disorder, as well as an increased risk of developing schizophrenia occurs in first-degree relatives of bipolar patients [5]. Another idea of the psychosis continuum is the psychosis dimension, with extreme points between the lack of psychotic symptoms and full-blown psychosis. As Linscott and van Os [6] demonstrated, psychotic experiences occur during the lifetime in 7% of the healthy population. Schizotypy is considered a phenomenon mostly associated with schizophrenia, but the severity of schizotypal traits is significantly higher in BD compared to healthy subjects [7].

The studies on genetic determinants of schizotypy have corresponded to genetic research on both schizophrenia and BD. Among dopaminergic system genes, the gene for catechol-O-methyltrasferase (*COMT*) – the enzyme associated with the degradation of dopamine, was most frequently studied. The *COMT* gene has a functional polymorphism *Val108Met*, determining different enzymatic activity. Numerous studies have found an association between this polymorphism, and schizotypy and its dimensions, measured by the O-LIFE, in healthy subjects, relatives of schizophrenia patients and in patients with BD [8–12]. The polymorphism of the *COMT* gene also determines a number of clinical characteristics of patients with schizophrenia and BD [13]. In re-

cent years, an association between schizotypy and such genes as *ZNF804A* (zinc finger protein 804A) [14] and *CACNA1C* (Alpha 1C subunit of the L-type voltage-gated calcium channel) [15], identified on the basis of GWAS (genome-wide association studies), has been shown. The first gene was initially recognized as a gene for schizophrenia, and later, its association with BD was shown [16]. In contrast, an association with the *CACNA1C* gene was initially found for bipolar disorder, and later, also for schizophrenia [17].

The study of schizophrenia and BD carried out in the Department of Adult Psychiatry in Poznan in which the TEMPS-A (Temperament Evaluation of Memphis, Pisa, Paris and San Diego – Autoquestionnaire version), measuring 5 affective temperaments, was used, demonstrated the similarities between these diseases for 4 temperaments studied. The only difference was observed for irritable temperament, which level was higher in the BD group [18].

This year will mark a half of a century since the release of the publication of Angst [19] and Perris [20], indicating a separate inheritance of UD and BD. Since then, BD and UD have been considered separate nosological entities. In several studies, differences between depressive episodes in the course of UD and BD have been demonstrated, both in terms of clinical symptoms and treatment. A Polish DEP-BI study, showed that, in BD, a significantly higher prevalence of depression with onset before 25 years of age, postnatal depression, psychotic depression, and drug-resistant depression occurs, compared to UD [21, 22]. Antidepressants are commonly used in the treatment of UD, but their use in BD is significantly limited [23]. In the last edition of the Diagnostic and Statistical Manual (DSM-5), UD and BD were classified as two different diagnostic groups [24].

Although the differences between those two types of affective disorders are widely acknowledged, it should be indicated that an important element of the course of UD is a possibility of diagnostic conversion into BD, and, in 50% of cases, BD starts with a depressive episode [25]. In the study of Angst et al. [26], a frequency of such conversion in patients with UD was 1.5% per year, and in the only Polish study, performed by Dudek et al. [27], it amounted to 1.8% of patients per year. Risk factors for conversion into BD included early onset of the illness, family history of (hypo) manic states, frequent episodes of illness, frequent hospitalizations, and depression resistant to antidepressants. Our study using the TEMPS-A, in which we compared patients with BD and UD, showed significantly higher scores of cyclothymic and irritable temperaments in the bipolar group compared with UD, and also a higher score (although without statistical significance) of hyperthymic temperament. We put forward a hypothesis that higher scores on these temperaments in patients with UD may also constitute risk factors for diagnostic conversion into BD [18].

Aim

The aim of the present study was to assess schizotypy, by means of the O-LIFE, in patients with schizophrenia, BD and UD, in the context of similarities between schizophrenia and BD, and differences between BD and UD.

Methods

Participants

The study included 167 patients of the Department of Adult Psychiatry in Poznan. They constituted three groups: a) patients with schizophrenia (N = 58; 34.7% of the total sample); b) patients with bipolar disorder (N = 52; 31.1% of the total sample); c) patients with unipolar depression (N = 57; 34.1% of the total sample). The age of participants ranged from 19 to 74 years (mean = 41.6 years; SD = 13.6; the mean age in patients with schizophrenia = 34.0, SD = 9.8; in patients with bipolar disorder, mean age = 40.3, SD = 13.6; in patients with depression mean age = 50.2, SD = 11.9). All participants were of Polish population and gave their written consent to participate. The project received approval of the Bioethics Committee, Poznan University of Medical Sciences.

In order to reduce an effect of confounding variable, i.e. symptom intensity, in all the patients, the study was performed during remission. Consequently, before proceeding with the O-LIFE, the procedures assessing current mental state were employed. In schizophrenia patients, the Positive and Negative Syndrome Scale (PANSS), in BD – the Young Mania Rating Scale (YMRS) and the Hamilton Depression Rating Scale (HDRS), and in UD – the HDRS, were used. The patient with schizophrenia should receive a score of 60 points or less on the PANSS, patient with BD 7 points or less on the YMRS and HDRS, and patients with UD – 7 points or less on the HDRS to be qualified as remission and included into the study.

Psychometric evaluation

The assessment of dimensions of schizotypy has been carried out by using the Polish version of the O-LIFE (Oxford-Liverpool Inventory of Feelings and Experiences), following the procedures of translation and back-translation, approved by Gordon Claridge, the author of the scale. A full version of the scale was used, originated in 1995. It contains 104 items: 30 – for *unusual experiences*, 24 – for *cognitive disorganisation*, 27 – for *introvertive anhedonia*, and 23 – for *impulsive nonconformity* [28].

Statistical analysis

Statistical analysis was performed using SPSS 21 statistical package.

The used statistical methods depended on specific research purposes. The following tests were employed: χ^2 test (to establish relationship between sex and diagnosis), one-way ANOVA test with with post-hoc Tukey test for unequal number of people in groups (to assess differences between the groups). The significance level of the results for pair comparisons was subject to Holm's correction for multiple comparisons. The effect size was calculated according to Glass' estimator formula, with 95% confidence interval [29].

The Cronbach's alpha coefficients were calculated for all subscales of the Polish O-LIFE version to determine their consistency. The reliability levels for individual

subscales were as follows: unusual experiences – alpha = 0.91; cognitive disorganisation – alpha = 0.91; introvertive anhedonia – alpha = 0.82; impulsive nonconformity – alpha = 0.77. The obtained results allow to recognize the Polish O-LIFE version as reliable.

Results

Sex distribution in our sample is relatively symmetrical ($\chi^2(1) = 0.15$; $p = 0.699$), the study included 81 males (48.5% of the total sample) and 86 females (51.5% of the total sample), aged from 19 to 74 years (M = 41.6 years, SD = 13.6). A half of the participants had 42 years or less. There was no relationship between gender and diagnosis ($\chi^2(2) = 4.99$; $p = 0.083$), although there are slightly more males in schizophrenia group and slightly more females in bipolar group.

The results obtained in four subscales of the O-LIFE across diagnostic populations are shown in Table 1 and Figure 1.

Table 1. **Results of the O-LIFE subscales in three diagnostic groups**

	SCHI	BD	UD	Difference
Unusual experiences				
Mean	0.32	0.32	0.20	SCHI = BD > UD
SD	0.23	0.25	0.22	
Median	0.33	0.23	0.13	
Skewness	0.33	0.92	0.89	
Cognitive disorganization				
Mean	0.51	0.56	0.50	Insignificant differences
SD	0.26	0.28	0.31	
Median	0.46	0.48	0.56	
Skewness	0.13	-0.10	-0.18	
Introvertive anhedonia				
Mean	0.38	0.34	0.40	Insignificant differences
SD	0.20	0.20	0.16	
Median	0.39	0.32	0.43	
Skewness	0.15	0.63	0.45	
Impulsive nonconformity				
Mean	0.30	0.39	0.22	BD > SCHI > UD
SD	0.15	0.22	0.14	
Median	0.29	0.33	0.24	
Skewness	0.34	0.53	0.79	

SCHI – schizophrenia; BD – bipolar disorder; UD – unipolar disorder

Generally, for schizotypal traits measured by the O-LIFE, the largest differences were recorded for dimension *unusual experiences* and *impulsive nonconformity*. With regard to the dimension of *unusual experiences* the UD group achieved results significantly lower than the other two diagnostic categories. In relation to *impulsive nonconformity*, the highest results were obtained by patients with BD and the lowest – by patients with depression.

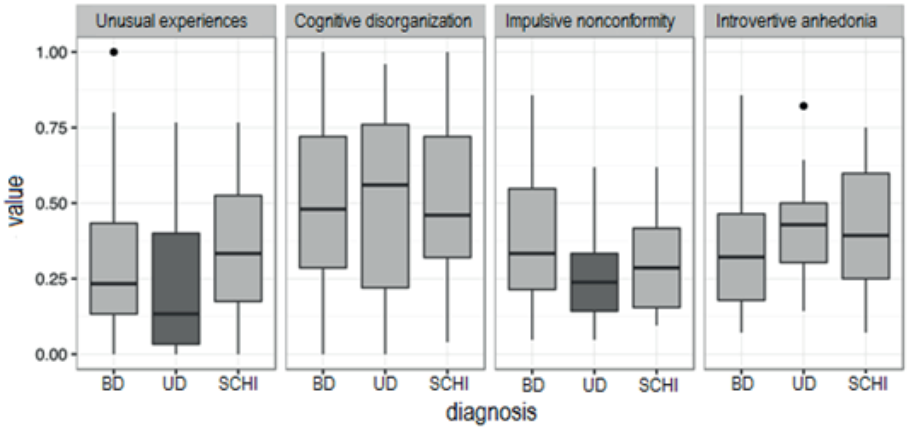

Figure 1. **Comparison of the results obtained in the O-LIFE subscales in different diagnostic categories**

SCH – schizophrenia; BD – bipolar disorder; UD – unipolar depression. Significance of differences (ANOVA, post hoc Tukey test) is marked with darker colour. Unusual experiences: difference between UD and SCH, p = 0.035. Impulsive nonconformity: difference between BD and UD, p = 0.021.

The dimensions of schizotypy significantly differentiating UD and schizophrenia are *unusual experiences* (t(36) = 2.67; p = 0.035; SMD = 0.75 (0.37–1.13)). The dimension of schizotypy significantly differentiating between patients with BD and UD is *impulsive nonconformity* (t(54) = 3.18; p = 0.021; SMD = 0.73 (0.34–1.11)). The score on both unusual experiences and impulsive nonconformity was significantly higher in patients with BD, compared to UD.

Discussion

This study gives an opportunity to compare the dimensions of schizotypy, measured by the O-LIFE, in schizophrenia and affective disorders. Here, for the first time, the O-LIFE was used to measure schizotypy in patients with unipolar depression.

It was found that similarities between schizophrenia and bipolar disorder exist in three out of four examined schizotypal dimensions, measured by the O-LIFE. Two of them: *unusual experiences* and *cognitive disorganization* make the so-called "positive" schizotypy. The high level of positive schizotypy is associated with the occurrence

of psychotic disorders, especially schizophrenia [1] but also BD [7]. Several studies have indicated a common genetic factor underlying bipolar disorder and schizophrenia, and schizotypal traits could make an intermediate phenotype between these diseases [30–32].

The only dimension of schizotypy differentiating schizophrenia and BD was *impulsive nonconformity* (higher in BD). This may correspond to the TEMPS-A results, where the only temperament differentiating schizophrenia and bipolar disorder was irritable temperament, higher score in BD. Symptoms of irritability constitute a criterion for manic and mixed states in the course of BD, but are not important for diagnosis of schizophrenia. The similarities between schizophrenia and bipolar disorder shown by means of the O-LIFE, and previously by the TEMPS-A, do not preclude a possibility of other differences between these illnesses that can be revealed by the use of other tools assessing personality.

The study has demonstrated differences between BD and UD in two dimensions of the O-LIFE: *unusual experiences* and *impulsive nonconformity*. As already mentioned, unusual experiences are associated with psychotic symptoms. This can be a confirmation of the DEP-BI results, which demonstrated that depression with psychotic symptoms is significantly more common in BD than in UD [22, 23]. It would be interesting to study this dimension in patients with psychotic depression in the course of UD.

The second dimension which differentiated BD and UD was higher *impulsive nonconformity* in the bipolar group. This feature is most specific for BD, differentiating this illness, as mentioned above, also from schizophrenia. Kwapil et al. [33] conducted 13-year study and compared results of a group of former students with high level of hypomania with the results of control group. The results showed that a higher score obtained on impulsive nonconformity scale was a significant predictor for subsequent development of bipolar disorder, which was subsequently confirmed by Bleichert and Meyer [34]. The correlation between impulsivity and bipolarity was also obtained by Dudek et al. [35] in a group of people practicing extreme sports. In a study conducted in the Department of Adult Psychiatry in Poznan, it was found that in bipolar patients *impulsive nonconformity* measured by the O-LIFE was mostly connected with the features of creativity [36]. Therefore, obtaining high scores for dimensions of *unusual experiences* and *impulsive nonconformity* on the O-LIFE, in patients with UD may make an additional risk factor indicating the likelihood of diagnostic conversion into BD.

A limitation of our study was different age in the studied groups: patients with BD were older than patients with schizophrenia and patients with UD were older than patients with BD. However, there is no data indicating a significant correlation between dimensions of the O-LIFE and age. Therefore, it should not significantly affect the interpretation of the results obtained in the O-LIFE, addressing contemporary concepts of similarity between schizophrenia and bipolar disorder and differences between two groups of affective disorders.

Conclusions

The results obtained in this study indicate that the assessment of schizotypy by means of the O-LIFE allows to address contemporary pathogenic and clinical concepts of schizophrenia and affective disorders.

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